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Satellite-observed upwelled region and prime eddy off Somali coast during Monex-79

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Abstract. An upwelled region as seen through satellite imagery off the Somali coast is compared with sea surface temperature during summer Monex-79. The relationship between satellite-derived low-level cloud drift winds and the sea-surface temperature is studied. Cloudiness associated with a prime eddy off the Somali coast is also studied. It is observed that the upwelled region has a unique crescent shape and reflects the sea-surface temperature that is driven by low-level strong winds. The prime eddy, as observed through a satellite imagery, shows that low cloud convection tends to be greater over the warm waters of the prime eddy, and the upwelled cold water tends to encircle the eddy leading to the identification of its outer boundary.

Keywords. Prime eddy; crescent-shaped upwelled region; satellite-derived low-level winds; Somali current; Monex.

1. Introduction

During the months of northern summer, the Somali current commences south of equator by late April and flows along the east African coast (Leetmaa 1972, 1973). It then progresses northward during May and reaches its full strength during July and August (Swallow and Bruce 1966). Large anticyclonic eddies (diameter 400–600 km) are formed off the Somali coast during monsoon season and is termed as prime eddies (Bruce 1979). Generally, these eddies are formed between 4 and 12°N and between the Somali coast and 58°E. In some years, an eddy of small size forms adjacent to and south of the prime eddy. Using SST reports from ships and satellite-sensed SST data Evans and Brown (1981) showed that prime eddy occurred each year with some variation in the location of the southern eddy. A cloud-free area is seen off the Somali coast during each monsoon season, and it remains prominent during the established phase of the monsoon season. During the summer Monex-79, a crescent-shaped cloud-free area and the prime eddy were seen through satellite imagery off the Somali coast. In this paper an attempt has been made to investigate the oceanic features and the cloudiness patterns associated with these phenomena.

2. Data

2.1 *Satellite data*

During FGGE year 1979, Indian ocean geostationary satellite (GOES-IO) was specially brought to a new location of 60°E to observe the atmospheric activity.